

TECHNOLOGY NEEDS/OPPORTUNITIES STATEMENT

REMOTE SLUDGE REMOVAL METHODS FOR THE PLUTONIUM RECLAMATION FACILITY CANYON FLOOR

Identification No.: RL-NM-00-010

Date: September 2000

Program: Nuclear Materials Stabilization

OPS Office/Site: Richland Operations Office/Hanford Site

PBS No.: RL-CP03

Waste Stream: N/A

TSD Title: N/A

Operable Unit (if applicable): N/A

Waste Management Unit (if applicable): N/A

Facility: Plutonium Finishing Plant

Priority Rating:

This entry addresses the “Accelerated Cleanup: Paths to Closure (ACPC)” Priority:

- ☐ 1. Critical to the success of the ACPC
- ☒ 2. Provides substantial benefit to ACPC projects (e.g., moderate to high lifecycle cost savings or risk reduction, increased likelihood of compliance, increased assurance to avoid schedule delays)
- ☐ 3. Provides opportunities for significant, but lower cost savings or risk reduction, and may reduce uncertainty in ACPC project success.

Need Title: Remote Sludge Removal Methods for the Plutonium Reclamation Facility Canyon Floor

Need/Opportunity Category: *Technology Opportunity*

Need Description:

- **Description:** A method to remotely remove sludge from the PRF Canyon floor is needed, since manned entry is not permitted. Past practice for canyon floor cleanup used large quantities of nitric acid to dissolve sludges, with the solution being processed through the PRF solvent extraction system and the plutonium eventually converted to metal in the RMC line. Those processes are no longer viable. An alternative technology is needed.
- **Background:** The PRF canyon floor is lined with stainless steel, with horizontal separators to form cells. About 18kg of plutonium is estimated to be in the sludge material on the floor.

This material must be removed and dispositioned to allow further PRF terminal cleanout to proceed.

Schedule Requirements: The technology should be available by October 2005 to allow the material removed to be processed through the stabilization and packaging processes immediately after vault materials are completed. Earlier removal would need to be coordinated with a window of availability for thermal processing, which may occur if the proposed “hot box” concept quickens the pace of the 234-5Z furnaces.

Earliest Date Required: October 2003

Latest Date Required: FY 2005

Problem Description: See description above.

Potential Life-Cycle Cost Savings of Need (in \$000s) and Cost Savings Explanation: A specific cost savings is not determined for this technology need, as a baseline for comparison is not defined.

Benefit to the Project Baseline of Filling Need: The sludge on the PRF canyon floor must be removed to proceed through the terminal cleanout schedule on the project baseline.

Relevant PBS Milestone: TRP-12-500 236-Z Cleanout Complete

Functional Performance Requirements: Cleanout levels are not yet defined, as the endpoints for the facility are not definite. However, the end goal is a slab on grade configuration, which would imply that the sludge removal would need to leave fairly low plutonium amounts, so that decontamination efforts could effectively proceed. Any removal technology should produce minimal waste and preferably no liquid waste, and provide the sludge in a configuration that could be easily handled and transferred to stabilization processes.

Work Breakdown Structure (WBS) No.:

TIP No.:

1.04.05.01.13

N/A

Justification For Need:

Technical: Remote removal technology is required since manned access is prohibited. The sludge must be removed since the material is likely above 30 wt% plutonium concentration and thus will be required by the 3013 standard to be dispositioned through a stabilization and packaging process. The material must also be removed to a level that will allow effective decontamination and decommissioning efforts to commence.

Regulatory: None.

Environmental Safety & Health: None.

Cultural/Stakeholder Concerns: None.

Other: N/A

Current Baseline Technology: None.

End-User: Fluor Hanford, Inc., Nuclear Materials Stabilization Project

Contractor Facility/Project Manager: George W. Jackson, Director, Nuclear Materials Stabilization Project, Fluor Hanford, Inc. 509-373-6622

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